WHAT IS CLAIMED IS:

1. A transreflector comprising a transparent substrate having opposite sides, optical deformities on at least one of said sides, a plurality of surfaces on or in said substrate for reflecting light striking one of said sides, and a plurality of light transmissive surfaces on or in said substrate for transmitting light striking one of said sides.

2. The transreflector of claim 1 wherein said substrate is a film.

3. The transreflector of claim 1 wherein said substrate is a multilayer film.

4. The transreflector of claim 3 wherein said multilayer film is comprised of a carrier film and an ultra-violet curable layer.

5. The transreflector of claim 1 wherein said substrate is a plate.

6. The transreflector of claim 1 wherein said reflective surfaces and said transmissive surfaces vary in at least one of the following: size, shape, angle, and orientation.

7. The transreflector of claim 1 wherein said deformities have at least two surfaces, one of said surfaces being said reflective surfaces, and the other of said surfaces being said light transmissive surfaces.

8. The transreflector of claim 1 wherein at least some of said optical deformities overlap each other.

9. The transreflector of claim 8 wherein at least some of said optical deformities are staggered with respect to each other.

10. The transreflector of claim 8 wherein at least some of said optical deformities intersect each other.

11. The transreflector of claim 8 wherein at least some of said optical deformities interlock each other.

12. The transreflector of claim 1 wherein said optical deformities are randomized.

13. A transreflector comprising a transparent substrate having opposite sides, a plurality of sloping reflective surfaces on or in said substrate for reflecting light striking one side of said substrate and a plurality of other sloping light transmissive surfaces on or in said substrate for transmitting light striking the other side of said substrate.

14. The transreflector of claim 13 wherein said reflective surfaces reflect a greater portion of the light striking said one side of said substrate.

15. The transreflector of claim 13 wherein said light transmissive surfaces transmit a greater portion of the light striking the other side of said substrate.

16. The transreflector of claim 13 wherein said reflective surfaces reflect a greater portion of the light striking said one side of said substrate and said light transmissive surfaces transmit a greater portion of the light striking the other side of said substrate.

17. The transreflector of claim 13 wherein said reflective surfaces are coated with a reflective coating.

18. The transreflector of claim 17 wherein said reflective coating comprises a polarization coating.

19. The transreflector of claim 13 wherein said reflective surfaces are sloped outward relative to the longitudinal axis of said substrate and said light transmissive surfaces are sloped inward relative to the longitudinal axis of said substrate.

20. The transreflector of claim 13 wherein said reflective surfaces have a substantially larger projected surface area, when projected onto a plane parallel to said substrate, than the projected surface area of said light transmissive surfaces when projected onto a plane parallel to said substrate.

21. The transreflector of claim 13 wherein said light transmissive surfaces have a substantially larger projected surface area, when projected onto a plane normal to the angle of maximum intensity of the light striking the other side of said substrate, than the projected surface area of said reflective surfaces when projected onto a plane normal to the angle of maximum intensity of the light striking the other side of said substrate.

22. The transreflector of claim 13 wherein said light transmissive surfaces have a substantially larger projected surface area, when projected onto a plane normal to the angle of maximum intensity of the light striking the other side of said substrate, than the projected surface area of said reflective surfaces when projected onto a plane normal to the angle of maximum intensity of the light striking the other side of said substrate, the light striking the other side of said substrate coming from a backlight.

23. The transreflector of claim 13 wherein said reflective surfaces are substantially planar.

24. The transreflector of claim 13 wherein said reflective surfaces are curved.

25. The transreflector of claim 13 wherein said light transmissive surfaces are textured.

26. The transreflector of claim 13 wherein said light transmissive surfaces have optical shapes.

27. The transreflector of claim 13 wherein said light transmissive surfaces have an antireflection coating.

28. The transreflector of claim 13 wherein said reflective surfaces and said light transmissive surfaces are formed by a plurality of grooves in said substrate.

29. The transreflector of claim 13 wherein said reflective surfaces and said light transmissive surfaces are formed by a pattern of individual optical deformities on or in said substrate each having a well defined shape.

30. The transreflector of claim 13 wherein said reflective surfaces and said light transmissive surfaces are on or in said other side of said substrate and said one side of said substrate is shaped to redirect light.

31. The transreflector of claim 30 wherein said one side of said substrate has at least one of a texture, and optical deformities shaped to redirect the light transmitted by said transreflector.

32. The transreflector of claim 31 wherein said optical deformities comprise at least one of the following: prismatic grooves, lenticular grooves, cross grooves, and individual optical elements or deformities of well defined shape.

33. The transreflector of claim 13 wherein said reflective surfaces and said light transmissive surfaces are on or in said one side of said substrate and said other side of said substrate is shaped to redirect or transmit light.

34. The transreflector of claim 33 wherein said other side of said substrate has optical shapes that transmit light from a backlight or other light source and redirect the light to said light transmissive surfaces.

35. The transreflector of claim 34 wherein said optical shapes comprise at least one of the following: prismatic grooves, lenticular grooves, cross grooves, and individual optical deformities of well defined shape.

36. The transreflector of claim 34 wherein said optical shapes comprise a pattern of individual optical deformities of well defined shape on or in said other side of said substrate.

37. The transreflector of claim 36 wherein the size of said optical deformities varies across said substrate.

38. The transreflector of claim 36 wherein the density of said optical deformities varies across said substrate.

39. The transreflector of claim 36 wherein the orientation of said optical deformities varies across said substrate.

40. The transreflector of claim 36 wherein the angle of said optical deformities varies across said substrate.

41. The transreflector of claim 36 wherein at least some of said optical deformities vary in at least one of the following characteristics: position, size, height, density, angle, orientation, and shape.

42. A transreflector comprising a transparent substrate having opposite sides, optical deformities on at least one of said sides, at least one reflective surface on or in said substrate for reflecting light striking one of said sides, and at least one light transmissive surface on or in said substrate for transmitting light striking the other of said sides.

43. A method of making a transreflector from a transparent substrate comprising the steps of applying a reflective coating to one side of the substrate, and thermoforming such one side to form a plurality of angled reflective coated surfaces and a plurality of other angled non-coated light transmissive surfaces.

44. The method of claim 43 wherein the light transmissive surfaces are textured to redirect or transmit light.

45. The method of claim 43 wherein optical shapes are formed on or in the light transmissive surfaces to redirect or transmit light.

46. The method of claim 43 further comprising the step of forming optical shapes on or in the other side of the substrate to redirect or transmit light from a backlight or other light source.

47. The method of claim 43 further comprising the step of forming a pattern of individual optical deformities on or in the other side of the substrate to redirect or transmit light.

48. The method of claim 47 wherein each of the optical deformities is formed into a well defined shape.

49. The method of claim 47 wherein the size of the optical deformities is varied across the substrate.

50. The method of claim 47 wherein the density of the optical deformities is varied across the substrate.

51. The method of claim 47 wherein the orientation of the optical deformities is varied across the substrate.

52. The method of claim 43 further comprising the step of forming optical deformities on or in the other side of the substrate.

53. A method of making a transreflector from a transparent substrate comprising the steps of applying a reflective coating to the substrate and then selectively removing the coating to form a plurality of light transmissive surfaces.

54. A method of making a transreflector from a transparent substrate comprising the steps of forming a plurality of spaced surfaces or

areas on or in one side of the substrate, and applying a reflective coating, film or layer on some of the surfaces or areas to reflect ambient light but not on other of the surfaces or areas to transmit light from a backlight.

55. The method of claim 54 wherein the reflective coating is a metallized coating that is deposited onto some of the surfaces or areas using a line of site deposition technique.

56. The method of claim 54 wherein the reflective coating is hot stamped onto some of the surfaces or areas.

57. The method of claim 54 wherein the reflective coating is a secondary film applied to or in close proximity to some of the surfaces or areas.

58. The method of claim 54 further comprising the step of texturing the other surfaces or areas.

59. The method of claim 54 further comprising the step of forming optical shapes on or in the other surfaces or areas.

60. The method of claim 54 further comprising the step of forming optical deformities on or in the other side of the substrate.

61. The method of claim 54 further comprising the step of applying an antireflection coating to the other surfaces or areas.

62. A transreflector comprising at least two transparent substrates of different indices of refraction at least partially bonded together along mating sides of said substrates, the mating side of one of said substrates

having a pattern of optical deformities, and the mating side of an other of said substrates having an inverse pattern of said optical deformities.

63. The transreflector of claim 62 wherein said substrates are bonded together in selective areas along mating sides of said substrates.

64. The transreflector of claim 62 wherein said substrates are completely bonded together along mating sides of said substrates.

65. The transreflector of claim 62 wherein at least some of said optical deformities overlap each other.

66. The transreflector of claim 65 wherein at least some of said optical deformities are staggered with respect to each other.

67. The transreflector of claim 65 wherein at least some of said optical deformities intersect each other.

68. The transreflector of claim 65 wherein at least some of said optical deformities interlock each other.

69. The transreflector of claim 62 wherein said optical deformities are randomized.

70. The transreflector of claim 62 wherein the other side of the substrate that has the lower index of refraction has optical deformities shaped to transmit light emitted from a backlight or other light source.

71. The transreflector of claim 62 wherein the other side of the substrate that has the higher index of refraction has at least one of a

texture, and optical deformities shaped to redirect the light transmitted by the transreflector.

72. The transreflector of claim 62 wherein said pattern and said inverse pattern of optical deformities comprise at least one of the following: prismatic grooves, lenticular grooves, cross grooves, and individual optical deformities of well defined shape.

73. The transreflector of claim 72 wherein said individual optical deformities have at least one of the following shapes: pyramidal, frusto-pyramidal, planar with rounded sides, conical, frusto-conical, oppositely sloping sides with oppositely rounded ends, and semispherical.

74. The transreflector of claim 62 which comprises more than two transparent substrates of different indices of refraction bonded together along mating surfaces of said substrates, and optical deformities on outer surfaces of the outermost substrates.

75. A method of making a transreflector out of at least two transparent substrates having different indices of refraction comprising the steps of preforming a pattern of optical deformities on or in one side of one of the substrates, using the preformed pattern of optical deformities on or in one side of the one substrate to form an inverse pattern of the optical deformities in or on one side of an other substrate, and bonding the one sides of the substrates together with the optical deformities and inverse optical deformities in mating engagement with one another.

76. The method of claim 75 wherein the inverse pattern of optical deformities is formed on or in one side of the other substrate by melting or heat softening the one side of the other substrate and pressing the melted or

softened side of the other substrate against the preformed pattern of optical deformities on or in the one side of the one substrate to form the inverse pattern of optical deformities in or on the melted or softened side of the other substrate while preventing the one side of the one substrate from melting or softening, and then cooling the substrates to cause the one side of the other substrate to harden and bond to the one side of the one substrate.

77. The method of claim 75 further comprising the step of forming optical deformities in the other side of the substrate that has the lower index of refraction shaped to transmit a specific distribution of light emitted from a backlight or other light source.

78. The method of claim 75 further comprising the step of forming optical deformities in the other side of the substrate that has the higher index of refraction shaped to redirect light.

79. The method of claim 75 further comprising the step of applying a texture to the other side of the substrate that has the higher index of refraction.

80. A method of making a transreflector out of at least one transparent substrate and a transparent ultra-violet curable polymer having different indices of refraction comprising the steps of preforming a pattern of optical deformities on or in one side of the one substrate, applying the polymer to the preformed pattern of optical deformities on or in the one side of the one substrate, and curing the polymer to form an inverse pattern of the optical deformities in the polymer and bond the polymer to the one side of the one substrate.

81. A transreflector and backlight system comprising a backlight including a light emitting panel member having a panel surface that emits a light ray output distribution, and a transreflector comprised of one or more layers each having a constant index of refraction, said transreflector having one side in close proximity to the panel surface of the backlight that transmits greater than 50% of the light ray output distribution from the panel surface incident on the one side and an other side opposite the one side that reflects more than 50% of ambient light incident on the other side.

82. The system of claim 81 further comprising a display in close proximity to the other side of the transreflector for receiving ambient light reflected by the transreflector and light from the backlight transmitted by the transreflector.

83. The system of claim 82 wherein the display is a liquid crystal display.

84. A transreflector and backlight system comprising a backlight including a light emitting panel member having at least one input edge for receiving light from a light source and at least one panel surface for emitting light, and a transreflector for transmitting light emitted by said panel surface incident on one side of said transreflector and for reflecting ambient light incident on the opposite side of said transreflector, at least one of said sides of said transreflector having optical deformities, a plurality of reflective surfaces on or in said transreflector for reflecting ambient light striking said opposite side of said transreflector and a plurality of light transmissive surfaces on or in said transreflector for transmitting light emitted by said panel surface striking said one side of said transreflector.

85. The system of claim 84 wherein said deformities have at least two surfaces, one of said surfaces being said reflective surfaces and the other of said surfaces being said light transmissive surfaces.

86. The system of claim 84 wherein said panel member has a pattern of individual optical deformities that are aligned with the optical deformities of said transreflector to increase the efficiency with which light is transmitted from said panel member to said transreflector.

87. The system of claim 86 wherein refractive index matching material is contained in a region between the aligned deformities of said panel member and said transreflector to further increase the efficiency with which light is transmitted from said panel member to said transreflector.

88. The system of claim 86 wherein said transreflector is comprised of multiple substrate layers.

89. The system of claim 88 wherein said transreflector includes a metallized film layer.

90. A transreflector and backlight system comprising a backlight including a light emitting panel member having at least one input edge for receiving light from a light source and at least one panel surface for emitting light, and a transreflector for transmitting light emitted by said panel surface incident on one side of said transreflector and for reflecting ambient light incident on the opposite side of said transreflector, one or the other of said sides of said transreflector having a plurality of angled reflective surfaces for reflecting the ambient light incident on said opposite side of said transreflector and a plurality of other angled light transmissive surfaces for

transmitting the light emitted by said panel surface incident on said one side of said transreflector.

91. The system of claim 90 wherein said reflective surfaces reflect more than 50% of the light striking said one side of said transreflector.

92. The system of claim 90 wherein said light transmissive surfaces transmit more than 50% of the light striking the other side of said transreflector.

93. The system of claim 90 wherein said reflective surfaces reflect more than 50% of the light striking said one side of said transreflector and said light transmissive surfaces transmit more than 50% of the light striking the other side of said transreflector.

94. The system of claim 90 wherein said panel member has a pattern of individual optical deformities for producing a particular light output distribution from said panel surface that is tuned to the side of the transreflector that receives incident light emitted by said panel surface such that said transreflector transmits a greater portion of the light emitted by said panel surface.

95. The system of claim 90 wherein said reflective surfaces and said light transmissive surfaces are formed in or on said opposite side of said transreflector, and said one side of said transreflector has optical deformities that transmit the incident light emitted from said panel surface and direct the light to said light transmissive surfaces in or on said opposite side of said transreflector.

96. The system of claim 95 wherein said optical deformities comprise at least one of the following: prismatic grooves, lenticular grooves, cross grooves and individual optical deformities of well defined shape.

97. The system of claim 96 wherein said individual optical deformities have at least one of the following shapes: pyramidal, frusto-pyramidal, planar with rounded sides, conical, frusto-conical, sloping sides with rounded ends, and semispherical.

98. The system of claim 95 wherein said optical deformities on or in said one side of said transreflector have a shape pattern that corrects for any non-uniformity in the light output distribution from said panel surface.

99. The system of claim 95 wherein said optical deformities on or in said one side of said transreflector have an angular shape pattern that changes with the distance from the input edge of said panel member to correct for changes in the angular distribution of the light emitted from said panel surface as the distance from the input edge of the panel member increases.

100. The system of claim 90 wherein said reflective surfaces and said light transmissive surfaces are in or on said one side of said transreflector, and said opposite side of said transreflector has optical deformities for redirecting the light exiting from said opposite side more toward the normal relative to said opposite side of said transreflector.

101. The system of claim 100 wherein said optical deformities comprise a pattern of prismatic surfaces.

102 The system of claim 100 wherein said optical deformities comprise a pattern of individual optical deformities each having a well defined shape.

103. The system of claim 90 wherein said reflective surfaces and said light transmissive surfaces are in or on said one side of said transreflector, and said opposite side of said transreflector has at least one of a texture, chemical etch, laser etch, and optical deformities shaped to redirect the light transmitted by said transreflector.

104. The system of claim 103 wherein said optical deformities comprise at least one of the following: prismatic grooves, lenticular grooves, cross grooves and individual optical deformities of well defined shape.

105. The system of claim 90 wherein said panel member has a pattern of individual optical deformities for producing a particular light output distribution from said panel surface, at least some of said deformities of said panel member having a well defined shape including at least one sloping surface for reflecting or refracting light impinging thereon out of said panel surface.

106. The system of claim 105 wherein said sloping surface of at least some of said deformities of said panel member is oriented to face an optically coupled area of said input edge across said panel member.

107. The system of claim 105 wherein the area of the sloping surface of at least some of said deformities of said panel member varies across said panel member to attain a desired light output distribution from said panel surface.

108. The system of claim 105 wherein said deformities of said panel member comprise depressions or projections in or on said panel member.

109. The system of claim 105 wherein said sloping surface of at least some of said deformities is a planar surface, further comprising at least one light source optically coupled to said input edge, said planar surface of the respective deformities of said panel member being oriented across said panel member to face an area of said input edge to which the light source is optically coupled.

110. The system of claim 105 wherein at least some of said deformities of said panel member are arranged in clusters across said panel member, and at least some of said deformities in each of said clusters have a different size characteristic that collectively produce an average size characteristic for each of said clusters that varies across said panel member.

111. The system of claim 105 wherein at least some of said deformities of said panel member are arranged in clusters across said panel member, and at least some of said deformities in each of said clusters have a different shape characteristic that collectively produce an average shape characteristic for each of said clusters that varies across said panel member.

112. The system of claim 111 wherein at least some of said deformities in each of said clusters have a different depth or height that collectively produce an average depth or height characteristic for each of said clusters that varies across said panel member.

113. The system of claim 111 wherein at least some of said deformities in each of said clusters have a different slope that collectively

produce an average slope characteristic for each of said clusters that varies across said panel member.

114. The system of claim 111 wherein at least some of said deformities in each of said clusters have a different orientation that collectively produce an average orientation characteristic for each of said clusters that varies across said panel member.

115. The system of claim 111 wherein at least some of said deformities in each of said clusters have a different width that collectively produce an average width characteristic for each of said clusters that varies across said panel member.

116. The system of claim 111 wherein at least some of said deformities in each of said clusters have a different length that collectively produce an average length characteristic in each of said clusters that varies across said panel member.

117. The system of claim 105 wherein the orientation of at least some of said deformities of said panel member varies across said panel member.

118. The system of claim 105 further comprising at least one light source optically coupled to said input edge, said deformities of said panel member being arranged in rows extending radially relative to an area of said input edge to which the light source is optically coupled.

119. The system of claim 105 further comprising a display having one side in close proximity to a side of said transreflector facing away from said panel member.

120. The system of claim 119 wherein said display is signage.

121. The system of claim 119 wherein said display is a liquid crystal display.

122. The system of claim 119 wherein said display is a membrane switch.

123. The system of claim 121 wherein said pattern of said optical deformities of said panel member is varied such that the spacing of said optical deformities of said panel member does not cause interference with any pixel spacing of the liquid crystal display.

124. The system of claim 110 wherein at least some of said optical deformities of said panel member have at least one additional surface for reflecting or refracting light impinging on said additional surface in different directions to spread light across said panel member to provide a more uniform distribution of light emitted by said panel surface.

125. The system of claim 124 wherein said additional surface is curved.

126. The system of claim 124 wherein said sloping surface is planar and said additional surface is curved.

127. The system of claim 126 wherein each of said optical deformities of said panel member only has two surfaces, said planar surface and said additional surface.

128. The system of claim 127 wherein said additional surface intersects said sloping surface.

129. A transreflector and backlight system comprising a backlight including a light emitting panel member having at least one input edge for receiving light from a light source and at least one panel surface for emitting light, and a transreflector for transmitting light emitted by said panel surface incident on one side of said transreflector and for reflecting ambient light incident on the opposite side of said transreflector, said transreflector comprising at least two transparent substrates of different indices of refraction bonded together along mating sides of said substrates, the mating side of one of said substrates having a pattern of optical deformities and the mating side of an other of said substrates having an inverse pattern of said optical deformities on the mating side of said one substrate, said one side of said transreflector that receives incident light from said panel surface being the lower index side of said transreflector, and the opposite side of said transreflector that receives incident ambient light being the higher index side of said transreflector.

130. The system of claim 129 further comprising a display closely adjacent said opposite side of said transreflector for receiving reflected light and transmitted light from said transreflector.

131. The system of claim 129 wherein said one side of said transreflector that receives incident light emitted from said panel surface has additional optical deformities shaped to transmit light emitted from said panel surface.

132. The system of claim 131 wherein said panel member has a pattern of individual optical deformities for producing a particular light

output distribution from said panel surface that is tuned to said one side of said transreflector that receives incident light emitted by said panel surface such that said transreflector transmits a greater portion of the light emitted by said panel surface.

133. The system of claim 131 wherein said pattern and said inverse pattern of optical deformities on the mating sides of said substrates comprise at least one of the following: prismatic grooves, lenticular grooves, cross grooves and individual optical deformities of well defined shape.

134. The system of claim 133 wherein said individual optical deformities have at least one of the following shapes: pyramidal, frusto-pyramidal, planar with rounded sides, conical, frusto-conical, sloping sides with oppositely rounded ends, and semispherical.

135. The system of claim 129 wherein the opposite side of said transreflector has at least one of a texture, and optical deformities shaped to redirect the light transmitted by said transreflector.

136. The system of claim 129 wherein said panel member has a pattern of individual optical deformities for producing a particular light output distribution from said panel surface, at least some of said individual optical deformities of said panel member having a well defined shape including at least one sloping surface for reflecting or refracting light impinging on said optical deformities of said panel member out of said panel surface.

137. The system of claim 136 wherein at least some of said deformities of said panel member are arranged in clusters across said panel member, and at least some of said deformities in each of said clusters have

a different size characteristic that collectively produce an average size characteristic for each of said clusters that varies across said panel member.

138. The system of claim 136 wherein at least some of said deformities of said panel member are arranged in clusters across said panel member, and at least some of said deformities in each of said clusters have a different shape characteristic that collectively produce an average shape characteristic for each of said clusters that varies across said panel member.

139. The system of claim 129 wherein the orientation of at least some of said deformities of said panel member varies across said panel member.

140. The system of claim 129 further comprising at least one light source optically connected to said input edge, said deformities of said panel member being arranged in rows extending radially relative to an area of said input edge to which the light source is optically coupled.

141. The system of claim 129 further comprising a display having one side in close proximity to the opposite side of said transreflector.

142. The system of claim 141 wherein said display is signage.

143. The system of claim 141 wherein said display is a liquid crystal display.

144. The system of claim 143 wherein said pattern of optical deformities of said panel member is varied such that the spacing of said optical deformities of said panel member does not cause interference with any pixel spacing of said liquid crystal display.

145. The system of claim 129 wherein at least some of said optical deformities of said panel member have at least one additional surface for reflecting or refracting light impinging on said additional surface in different directions to spread light across said panel member to provide a more uniform distribution of light emitted by said panel surface.